

What's New:

- Operational support for MESO-SAILS that enables up to 3 extra low level elevation scans in a volume scan.
- Addition of the Hail Size Discrimination Algorithm to the Hydrometeor Classification Algorithm and associated products.
- Addition of atmospheric model data to the level 2 data stream with playback capability.
- Removal of the following legacy products (product codes): 3-bit Reflectivity (16, 17, 18), 4-bit Reflectivity (21), 3-bit Velocity (22, 23, 24), 3-bit Spectrum Width (29), 3-bit Composite Reflectivity (35), 3-bit Cross Section (85, 86), 4-bit Dual Pol (158, 160, 162, 164).

Concise examples of successful command checklists for installation of the most recent CODE B17.0r1.13 are provided here for your reference.

A "quick install" checklist can simplify your process, and is helpful when you need to quickly make clones of your initial installation. Checklists ensure uniformity of installations. Use of a command set as similar as possible to the one provided above will make it easier for CODE maintainers to provide fast and efficient assistance, by quickly pinpointing where you are in the installation process.

All commands provided are written in the C shell, as that is the required shell for compilation and execution of the ORPG. Understand that these command sets may or may not work "as is" on your system due to possible differences in directory names on your system. Placement of these commands in a single script is not recommended due to execution requirements of the various commands, including occasional need for root privileges.

NWS & PUBLIC EDITIONS

Installation & Configuring Linux for ORPG

Checking Operating System

```
[dev1@dev1 ~]$ more /etc/redhat-release
Red Hat Enterprise Linux Client release 5.7 (Tikanga)
[dev1@dev1 ~]$ uname -a
Linux dev1 2.6.18-274.3.1.el5 #1 SMP Fri Aug 26
18:45:04 EDT 2011 i686 i686
i386 GNU/Linux
[dev1@dev1 ~]$
```

```
[dev2@dev2 ~]$ more /etc/redhat-release
CentOS release 5.11 (Final)
[dev2@dev2 ~]$ uname -a
Linux dev2 2.6.18-398.el5PAE #1 SMP Tue Sep 16
21:31:44 EDT 2014 i686 i686 i386 GNU/Linux
[dev2@dev2 ~]$
```

Modifying /etc/hosts

```
# Do not remove the following line, or various
programs
# that require network functionality will fail .
127.0.0.1      localhost.localdomain localhost
192.168.###.### dev2 rpg
```

Modifying /etc/sysconfig/network

```
NETWORKING=yes
NETWORKING_IPV6=no
HOSTNAME=dev2
```

Modifying /etc/sysconfig/networking/devices/ifcfg-eth0

```
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=none
NETMASK=255.255.255.0
USERCTL=no
PEERDNS=yes
GATEWAY=192.168.###.##
TYPE=Ethernet
IPADDR=192.168.###.###
```

1. Log into **ANY** account on your LINUX machine.
2. You are expected to have RedHat Enterprise 5 or CentOS 5(32-bit version because ORPG software is 32-bit only) & required Linux packages. Type:
more /etc/redhat-release
uname -a
(See e.g. on left). “i386 GNU/Linux” implies 32-bit version.
3. If you do not have RedHat Enterprise 5 or CentOS 5, install RedHat Enterprise 5 or CentOS 5 before continuing with this installation. See instructions in **code_b17_0r1_13/pdf_doc/v1_setup_code_b17_0r1_13.pdf** if needed.
4. Make sure below packages are installed. Type:
rpm -q giflib-devel ; rpm -q ncompress
rpm -q tcl-devel ; rpm -q tk-devel
rpm -q gsl ; rpm -q gsl-devel
If these packages are not installed, you need use yum to install them (“yum -y install package_name”). As root,
yum -y install giflib-devel
yum -y install ncompress
yum -y install tcl-devel
yum -y install tk-devel
yum -y install gsl
yum -y install gsl-devel
Install all available updates.
yum -y update
5. The ORPG requires that TCP/IP networking be configured; it is not compatible with DHCP. A common configuration error involves the hosts file. Open **/etc/hosts** with the editor of your choice and modify it to add the name and IP address of your PC. Be sure to alias the hostname to **rpg**. (See e.g. on left).
6. Open **/etc/sysconfig/network** with the editor of your choice and modify it to add the Hostname of your PC. (See e.g. on left).
7. Open **/etc/resolv.conf** with the editor of your choice and modify it to add the Nameserver. If you are not sure what it is ask your local SA. An example is:
nameserver 140.90.###.##
8. Open **/etc/sysconfig/networking/devices/ifcfg-eth0** with the editor of your choice and make sure it has been customized. (See e.g. on left). The eth0 file is the configuration file for the primary or only network interface card. The entries that must be customized for the workstation are: **IPADDR – the IP address;** **GATEWAY – the default router address;** **NETMASK – 255.255.255.0;** **ONBOOT – should be yes;** and **DEVICE – the filename.**
9. Copy all changed Networking files to the default directory. Answer **y** to overwrite. Type:
cd /etc/sysconfig/networking/profiles/default
cp /etc/hosts .
cp /etc/resolv.conf .
cp /etc/sysconfig/network .
cp /etc/sysconfig/networking/devices/ifcfg-eth0 .
10. Logout from root. Type:
exit
11. Reboot your system by typing:
reboot

Creating a New Account

1. From the RedHat Welcome Screen, enter your **Username and Password** to log into **ANY** account on your LINUX machine.
2. Open a terminal and type:
su (login as root with root password)
3. Determine your new user account name, parent directory, home directory, data directory, group name, etc. then write them down. **Whenever you see a command with <> brackets around it, refer to the table below.** Here are some suggested examples. Add your own names:

COMMANDS	DEFINED	EXAMPLES
<user17_0r1_13>		code17_0r1_13
<parent_dir>		/home
<home_dir>	<parent_dir>/<user17_0r1_13>	/home/code17_0r1_13
<group_name>		rpg
<ip_address>		192.168.##.###

Summary of Commands

```
[root@dev2 ~]# grep rpg /etc/group
[root@dev2 ~]# groupadd rpg

[root@dev2 ~]# useradd -d
/home/code17_0r1_13 -m -g rpg -s /bin/csh -c
"CODE B17.0r1.13" code17_0r1_13

[root@dev2 ~]# passwd code17_0r1_13
Changing password for user code17_0r1_13.
New password:
Retype new password:
passwd: all authentication tokens updated
successfully.
[root@dev2 ~]# chmod +rx
/home/code17_0r1_13
[root@dev2 ~]# exit
```

4. Check to see if the group already exists. (See e.g. on the left).
grep <group_name> /etc/group
If it does not exist, type:
groupadd <group_name>
5. Create a new account by using the useradd command. In your terminal type:
useradd -d <home_dir> -m -g <group_name> -s /bin/csh
-c "CODE B##r#.##" <user17_0r1_13>
(See e.g. on the left).
6. Create a password for the user and write it down somewhere. Type:
passwd <user17_0r1_13>
Enter new password when prompted twice.
7. Change modifications for home directory. Type:
chmod +rx <home_dir>
8. Logout from root. Type:
exit
9. To logout of the account you are in, select **Main Menu => Log Out**. Then click **OK**.

Installing RPG & CODE Software

1. Login using your new `<user17_0r1_13>` account and password.
2. Obtain the CODE B17.0r1.13 CD, copy folder **code_b17_0r1_13(for NWS Edition)** or **pub_code_b17_0r1_13(for Public Edition)** to your home directory.
3. Go to the home directory to make sure the folder has been downloaded by typing:
cd; ls -al
4. Copy the RPG source file to your home directory. Type:
If you have the NWS Edition:
cd code_b17_0r1_13/files_orpg_sw
cp -p rpg_b17_0r1_13_nws_src.tgz ~
If you have the Public Edition:
cd pub_code_b17_0r1_13/files_orpg_sw
cp -p rpg_b17_0r1_13_pub_src.tgz ~
5. Copy the CODE configuration file to your home directory. Type
cd ../config_files
cp -p code_config_b17_0r1_13.tgz ~
6. Uncompress the RPG source file by typing:
cd; ls
If you have the NWS Edition:
tar xvzf rpg_b17_0r1_13_nws_src.tgz
If you have the Public Edition:
tar xvzf rpg_b17_0r1_13_pub_src.tgz
7. Uncompress the CODE configuration file by typing:
tar xvzf code_config_b17_0r1_13.tgz
8. Go to the env directory and run the env script. Type:
cd code_config_b17_0r1_13/env; ls
./inst_env_config (answer **y** when prompted)
9. If more than one installed ORPG is going to run at the same time on a single workstation, open **orpg_env_cshrc** from your **\$HOME** directory with the editor of your choice and manually change the defined value of **RMTPORT** on each account. It is recommended that the first account have a value of 50000, the second 51000, etc. Create a backup of the file if changed. Type:
cd; cp orpg_env_cshrc orpg_env_cshrc.B17
10. Remove all tar files:
cd ; rm *tgz (answer **y** when prompted)
11. To logout of the account you are in, select **Main Menu => Log Out**. Then click **OK**.

Modifying orpg_env_cshrc

```
# in order to simultaneously run multiple
instances of the ORPG on a
# single platform, RMTPORT must differ.
setenv RMTPORT 51000
```

Compiling & Configuring the RPG

Modify the .rssd.conf file

```
# RPG Development Workstations
#Client: rpg
Client: 192.168.##.###

# Pathnames
#      [SORPGDIR]
Path: ORPGDIR

# NEW B9
Path: HOME/save_logs

# NEW B12x1.206
Path: HOME/security_logs
```

1. From the RedHat Welcome Screen, enter your **Username and Password** to login using your new **<user17_0r1_13>** account and password. Open a terminal console and verify your environment variables. Make sure your \$HOME is set to the correct paths. Type:
env | grep -e HOME
2. To conduct a quick test compile of a portion of the source code, type:
cd; ls
test_make_cpc100 \$HOME >& test_make_cpc100.out
After compilation has finished, check for errors. Type:
grep -e 'Error [1-9]' test_make_cpc100.out
If there are errors, check the file:
code_b17_0r1_13/pdf_doc/v1_setup_code_b17_0r1_13.pdf
3. To compile the RPG, type:
make_rpg \$HOME >& make_rpg.out
After compilation has finished, check for errors. Type:
grep -e 'Error [1-9]' make_rpg.out
If there are errors, check the file:
code_b17_0r1_13/pdf_doc/v1_setup_code_b17_0r1_13.pdf
4. Install the ORPG configuration files by typing:
cd code_config_b17_0r1_13/orpg; ls
./inst_orpg_config (answer **y** when prompted)
Note: You need answer '**N**' for NWS Edition or '**P**' for Public Edition when prompted to install the right version of task_tables.
5. If the hostname has been aliased to **rpg**, skip this step. Otherwise variable **Client** needs to point to the hostname or **<ip_address>**. Open **.rssd.conf** from your **\$HOME** directory with the editor of your choice. Modify the **Client** variable to be the **<ip_address>** of your machine. Save the file **.rssd.conf** and exit.
6. To logout, select **Main Menu => Log Out**, then click **OK**.

Testing the RPG & Installing CODE Software (1 of 2)

Testing the RPG: Steps 1-9

Using the HCI & play_a2 Tools

```
code17_0r1_13:code17_0r1_13/ 43 > hci &
[1] 7278
code17_0r1_13:code17_0r1_13/ 44 > play_a2
Playback...
Playing file:
/home/code17_0r1_13/ar2data/KMLB20121026_120332_V06.gz
Volume date [yyyy-mm-dd] 2012-10-26
Volume time [hh:mm:ss]: 12:03:35
```

1. From the RedHat Welcome Screen, enter your **Username and Password** to login using your new **< user17_0r1_13 >** account and password.
2. Open a terminal for testing the RPG. If errors, check the file: **code_b17_0r1_13/pdf_doc/v1_setup_code_b17_0r1_13.pdf**. Type: **mrpg -p -v startup**

Note: User should ignore below error message about syslog.lb. At the RPG startup with option -p, syslog.lb is deleted first thus can not be opened. It will be re-created by the RPG.

```
18:40:10 mrpg: ORPGDA: RSS_orpgda_lb_open $(ORPGDIR)/mngprg/syslog.lb
failed (ret = -43)
```

```
18:40:10 mrpg: ORPGDA_write ORPGDAT_SYSLOG failed (ret -43)
```

3. To check for running tasks type: **rpg_ps**
4. To make sure the human computer interface will run, type: **hci &**
5. Ingest default Archive II data into the HCI by typing: **play_a2**
When you are confident that data is being ingested into the HCI properly, press **Ctrl C** to end play_a2 then close the HCI. (See e.g. on left).
6. Check CVT version, **Version 4.4.3**. Type: **cvt version**
7. Launch CVG by typing: **cvg**
8. The title on the CVG window should show CODEview Graphics **9.2**. Close the CVG window by clicking File → Exit.
9. If everything works as expected, your CODE installation is complete. You can shutdown and cleanup the RPG by typing:

mrpg shutdown; mrpg cleanup

Remove all tar files:

rm ~/src/*tar

If you do not want to install the below options, you are done.

10. Obtain the CODE software archive files from code_b17_0r1_13/files_code_sw
cd code_b17_0r1_13/files_code_sw
cp -p code_alg_1_22a.tar ~/src
cp -p dp_test_prod.tar ~/cfg
11. To configure the CODE sample algorithms and copy the snippets, type:
cd ~/src; ls
tar xvf code_alg_1_22a.tar
cd cpc305
./install_sample_alg
12. To generate dual pol test products 340-344, 600-605 and 700-705, type:
cd ~/cfg
tar xvf dp_test_prod.tar
cd dp_test_prod
./install_dual_pol_test_prod.sh
The dual pol test products are configured in directory extensions
cd ../extensions ; ls
13. Re-start RPG, type:
mrpg -p -v startup
rpg_ps | grep sample
rpg_ps | grep dualpol8bit_test
rpg_ps | grep test_base_prods_8bit
14. Shutdown and cleanup the RPG by typing:
mrpg shutdown; mrpg cleanup

Option 1 – Install CODE software:

Steps 10-14

- Sample Algorithms
- Dual Pol Test Products
340-344
600-605
700-705

Testing the RPG & Installing CODE Software (2 of 2)

Option 3 – Install level II data: Steps 15-23

Modifying the .cshrc File

```
setenv AR2_DIR /opt/code/data/ar2data
```

15. A suggested location to install all of the desired CODE Archive II data sets is **/opt/code/data/ar2data**. Your local procedures might establish a different location. Check for the ar2data directory by typing:
cd /opt/code/data/ar2data
su (login as root with root password)
 If the directory has been created already, **go to next step**. (This directory might be different on your machine). If the directory has not been created, create the directories. Type:
cd /opt; mkdir code
cd code; mkdir data
cd data; mkdir ar2data
cd ar2data;
16. To install archive II data sets, obtain the CODE B17.0r1.13 CD, copy the desired data sets in ar2data directory to /opt/code/data/ar2data.
exit (to logout as root)
17. Check the **.cshrc** file to see if AR2_DIR has been set already. Type:
more ~/.cshrc | grep AR2_DIR
 If the \$AR2_DIR has not been set to /opt/... directory, open **.cshrc** from your **\$HOME** directory with the editor of your choice. Modify the **setenv AR2_DIR** line to point to **/opt/code/data/ar2data**. (See e.g. on left). Save the file **.cshrc** and exit the editor that you used.
18. Create a backup of the file, by typing:
cp .cshrc .cshrc.B17
19. For each console that is opened, type:
source .cshrc
20. Start the ORPG for testing Archive II data. If errors, check the file:
code_b17_0r1_13/pdf_doc/v1_setup_code_b17_0r1_13.pdf. Type:
mrpg -p -v startup
21. To start the human computer interface, type:
hci &
22. Ingest default Archive II data into the HCI by typing:
play_a2 -d f_load
 (If you downloaded another directory from the CD, replace f_load with the name of the downloaded directory). When you are confident that data is being ingested into the HCI properly, press **Ctrl C** to end play_a2 then close the HCI.
23. Shutdown and cleanup the RPG by typing:
mrpg shutdown; mrpg cleanup
24. **Installation is done.**

The End